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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Saint-Hilaire et al.   Art Unit: 2144
Serial No.:09/828,628   Examiner: Thanh Nguyen
Filed: April 5, 2001   Conf. No.:   5525
Title   : A FRAMEWORK FOR PROCESSING RELIABLE AND UNRELIABLE
          INFORMATION (AS AMENDED)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

DECLARATION BY THE INVENTOR UNDER 37 C.F.R. 1.131

I, Ylian Saint-Hilaire, declare as follows:

1.   I am a co-inventor of the subject matter claimed in the patent application identified above, U.S.S.N. 09/828,628 filed on April 5, 2001.

2.   The invention claimed in this application was made in the United States prior to August 31, 2000.

3.   As evidence of this date of invention, I have attached several photocopies of relevant pages from an invention disclosure form that served as the basis for the present application.   All dates that are deleted in these photocopies are prior to August 31, 2000.

4.   These pages from the invention disclosure form show that prior to August 31, 2000, I, and the other co-inventor of this application, had developed the subject matter claimed in the patent application.

Applicant : Ylian Saint-Hilaire et al.   Attorney's Docket No.: 10559-425001 / P10439
Serial No. : 09/828,628
Filed   : April 5, 2001
Page   : 2 of 2

    I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patents issued thereon.

Dated: 02/20/07   _____
                                            Ylian Saint-Hilaire

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Commissioner for Patents
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Alexandria, VA 22313-1450

DECLARATION BY THE INVENTOR UNDER 37 C.F.R. 1.131

I, Frederick William Strahm, declare as follows:

1.   I am a co-inventor of the subject matter claimed in the
patent application identified above, U.S.S.N. 09/828,628 filed
on April 5, 2001.

2.   The invention claimed in this application was made in
the United States prior to August 31, 2000.

3.   As evidence of this date of invention, I have attached
several photocopies of relevant pages from an invention
disclosure form that served as the basis for the present
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this application, had developed the subject matter claimed in
the patent application.

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United States Code and that such willful false statements may
jeopardize the validity of the application or any patents issued
thereon.

Dated: 22 Feb 07

Frederick William Strahm

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INTEL INVENTION DISCLOSURE
ATTORNEY-CLIENT PRIVILEGED COMMUNICATION

Software/ Internet / IAL / ICL

...accurate and detailed information on this form. The information will be used to evaluate your ... sible filing as a patent application. When completed and signed, please return this form to the **Legal** ... at JF3-147. If you have any questions, please call **264-0444.**

1. Inventor: __Saint-Hilaire__   __Ylian__   _____
     Last Name   First Name   Middle Initial
Phone __(503) 264-2188__   M/S: __JF3-206__   Fax # __(503) 264-9428__
Citizenship: __Canadian__   WWID: __10610963__   Contractor: YES _____   NO __X__
Inventor E-Mail Address: __ylian.saint-hilaire@intel.com__
Home Address: __1316 NE Carlaby way #173__
City __Hillsboro__   State __OR__   Zip __97124__   Country __US__
*Corporate Level Group (e.g. IABG, NCG, CEG) __NBG__   Division __IAL__   Subdivision __ICL__
Supervisor* __Prakash Iyer__   WWID __10055995__   Phone __503-264-1815__   M/S: __JF3-206__

Inventor: __Strahm__   __Bill__   _____
     Last Name   First Name   Middle Initial
Phone __(503) 264-4632__   M/S: __JF3-206__   Fax # __(503) 264-9428__
Citizenship: __US__   WWID: __10476175__   Contractor: YES _____   NO __X__
Inventor E-Mail Address: __bill.strahm@intel.com__
Home Address: __2168 NE 52th Ave__
City __Hillsboro__   State __OR__   Zip __97124__   Country __US__
*Corporate Level Group (e.g. IABG, NCG, CEG) __NBG__   Division __IAL__   Subdivision __ICL__
Supervisor* __Prakash Iyer__   WWID __10055995__   Phone __503-264-1815__   M/S: __JF3-206__

*If you are unsure of this information, please discuss with your manager.

(PROVIDE SAME INFORMATION AS ABOVE FOR EACH ADDITIONAL INVENTOR)

2. Title of Invention: __A method and apparatus for framing and processing messages over a reliable link__

3. What technology/product/process (code name) does it relate to (be specific if you can):
__PAWS group__

4. Include several key words to describe the technology area of the invention in addition to # 3 above: __mobility, roaming, VPN, wireless, optimization, packets__

5. Stage of development (i.e. 10% complete, simulations done, test chips if any, etc.): _____
__Prototype done, working on product release__

6. (a) Has a description of your invention been, or will it shortly be, published outside Intel:

     NO: __X__   YES: _____   If YES, was the manuscript submitted for pre-publication approval?

     IDENTIFY THE PUBLICATION AND THE DATE PUBLISHED: _____

     (b) Has your invention been used/sold or planned to be used/sold by Intel or others?

     NO: __X__   YES: _____   DATE WAS OR WILL BE SOLD: _____

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ATTOR

(c) Does this invention relate to technology that is or will be covered by a SIG (speci
or specification?

    NO: _X_   YES: _____   Name of SIG/Standard/Specification: _____

(d) If the invention is embodied in a semiconductor device, actual or anticipated date of tapeout?

(e) If the invention is software, actual or anticipated date of any beta tests outside Intel

7. Was the invention conceived or constructed in collaboration with anyone other than an Intel blue badge employee or in performance of a project involving entities other than Intel, e.g. government, other companies, universities or consortia?   NO: _X_   YES: _____   Name of individual or entity: _____

8. Is this invention related to any other invention disclosure that you have recently submitted? If so, please give the title and inventors: __"Wireless optimized, dynamically-mobile, secured VPN" and "A method for preserving reliable connection during connection handoff"__

PLEASE READ AND FOLLOW THE DIRECTIONS ON HOW TO WRITE A DESCRIPTION OF YOUR INVENTION

Please attach a description of the invention to this form, DATED AND SIGNED BY AT LEAST ONE PERSON WHO IS NOT A NAMED INVENTOR, and include the following information:

1.   **Describe in detail what the components of the invention are and how the invention works.**

This invention describes a way of framing and processing messages over a reliable link. This invention is primarily targeted at improving communications over wireless links (low bandwidth, high latency links). The disclosure "Wireless optimized, dynamically-mobile, secured VPN" describes how Intel plans to implements a wireless optimized stack. As part of this solution, a new way of framing messages was required that provided:

- Low overhead when framing control messages and application data
- Handling fragmentation of frames messages
    - Accumulate the message when required
    - Send partially received frames to application when possible
- Allowed for security, compression and proxy traversal to be applied to the master stream.
- Allow the mobility handoff to be applied at exactly the right place in the wireless stack
    - This required placement between the control (lower) and application data (upper) layers.

The key element of this invention is that would need to split framing work in order to place the mobility hand-off processing at the right place. We need to remove all "tunnel specific commands" from the stream, than apply mobility processing (byte counters, send buffers, acknowledgement decisions...), and then apply application data processing. We could have used a simpler, more obvious, engineering design by accumulating all the frames at the lower layer; this would not have provided the latency/split frames advantages that are described here.

Say you have, for example, multiple client and server applications whose traffic is aggregated onto a single reliable link (TCP/IP) to exchange messages. Applications may come and go and may or may not be aware of each other. Applications will send packet based messages (like UDP) or open stream connections (like TCP) to a peer application. In addition to this, control messages can be exchanged. All control messages are packet based.

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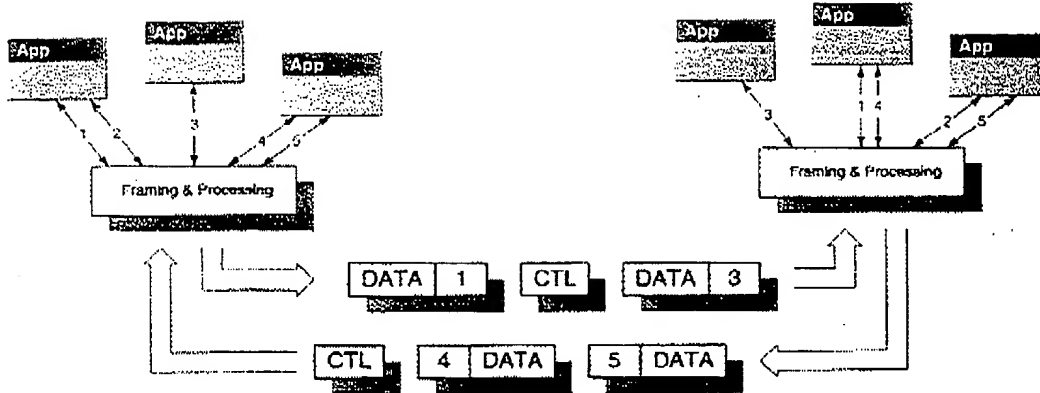
This diagram shows how the applications seem to have connections to peer applications even if in fact they are sharing a single reliable network connection. An "application" could also include a proxy acting on behalf of another computer or application, a relay applications or any kind of network software.

The framing and processing components talk to each other over a reliable link. An example of this include TCP, modified forms of TCP, forms of reliable UDP, Reliable layer 2 links... We make, for the rest of this document, the assumption that this master connection is stream basic (like TCP) and that processing needs to be applied to the master stream.

This processing could include one or more of:
    Roundtrip and bandwidth optimization
    Compression
    Security (privacy, integrity...)
    Quality of service
    Proxy traversal
    Resistance to connection loss
    Reliable handoff of the traffic to another master connection

These examples of processing may apply to some or all types of data. Including: reliable stream based, unreliable packet based, and control data.

In order to apply all this processing to the data correctly, a new strategy for processing and framing the data was required.

Standard processing and framing

In what we can call the standard way of processing and framing data over a single connection, data is processed in an application specific way and framed by our tunneling layer and the resulting stream is processed again (compression, security, proxy traversal).
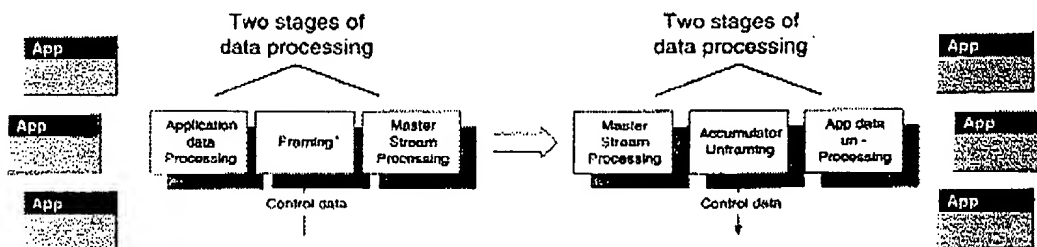
In this model, the application specific processing could include:
    Roundtrip and bandwidth optimization
    Application specific compression
    Basic quality of service

Framing typically involves adding a header to each application data fragment. This header would include an index number and fragment size. The framing would also add the control data to the stream.

The master stream processing would include: